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Ms. Karen Cibulskis
Remedial Project Manager
United States Environmental Protection Agency
Region V
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, IL 60604

Dear Karen:

Re: Final Groundwater Letter Work Plan
South Dayton Dump and Landfill Site Moraine, Ohio (Site)

This Letter Work Plan presents the South Dayton Dump and Landfill Potentially Responsible Party Group's (PRP Group's) approach for investigation of subsurface and groundwater conditions at the Site. The work will help address data gaps and provide information to aid in the completion of a Feasibility Study (FS). All work will be performed in accordance with the United States Environmental Protection Agency (USEPA) -approved Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Site-Specific Health and Safety Plan (HASP).

The PRP Group has prepared this Letter Work Plan based on discussions between the PRP Group and USEPA in February and April 2008. The Letter Work Plan incorporates comments received from USEPA on March 26, 2008 and May 5, 2008.

GROUNDWATER WORK OBJECTIVES

The general objectives for the phases of work discussed within this document include the following:

- define subsurface stratigraphy, including identifying till-rich zone(s) and sand and gravel aquifer zone(s) at locations beneath the Site to a depth of 100 feet below ground surface using Rotosonic drilling;
- collect data to assist in characterizing groundwater impact;
- recognizing that there may be seasonal or event-related differences in groundwater elevation, flow conditions and contaminant concentrations, and that there may be more

than one contaminant flow path and more than one source of groundwater contamination at the Site, attempt to: i) determine the appropriate screened interval(s) for shallow monitoring wells at Vertical Aquifer Sampling (VAS) locations through VAS data; ii) compare the screened intervals identified through VAS to the screened intervals and screen lengths in the existing wells; and iii) determine, based on these results and all existing data for the Site, if the screened intervals and screen length of the existing wells represent a zone of chemical impact in the shallow aquifer that is worthwhile to continue to monitor or not;

- characterize groundwater chemistry at Site monitoring wells through groundwater sampling and laboratory analysis; and
- collect groundwater and surface water elevation measurements over time to identify horizontal hydraulic gradients, flow directions, and, if nested wells are proposed in Phase 2, vertical hydraulic gradients.

Phase 1

In an effort to meet these objectives, Phase 1 will include three main work tasks VAS borings, synoptic water level measurements, and groundwater sampling for laboratory analysis.

1) VAS Borings

Figure 1 presents the locations of twenty-three on-Site VAS borings and two off-Site VAS borings (on the trailer park parcel). Additionally, the location of a soil boring that will be used to log the subsurface material below the large asphalt pile is presented on Figure 1. All of these borings, including the boring installed through the large asphalt pile, will be completed using Rotosonic drilling techniques. This drilling technique offers the opportunity to document relatively undisturbed soil sample cores, advance to the desired depth, and produces less waste than hollow stem auger drilling techniques. Additional details regarding Rotosonic drilling are provided in the FSP.

During borehole advancement, continuous soil cores will be observed, soil stratigraphy will be logged and cores will be screened with a photoioization detector (PID) for the presence of volatile organic compounds (VOCs), and screened for the presence of methane either by using a landfill gas meter (such as a Landtec GEM-500) or a flame-ionization detector (FID) calibrated for methane. Additionally, photographs will be taken of each 5-foot interval to obtain a photographic log of each borehole.

Core samples will be collected directly from the core barrel attached to the end of the drill string and extruded into cylindrical bags. Field measurements for VOCs and methane will be conducted along the cored material by piercing the plastic sleeve with the wand of the field instrument(s). In addition, the soils will be tested for the presence of non-aqueous phase liquids (NAPL) using the Sudan IV® dye test and/or another USEPA-approved shaker test, as appropriate. Field calibration, preventative maintenance, and SOPs for the PID and Sudan IV® dye test are included in the FSP.

Should the presence of NAPL be detected in a boring, the interval of detection will be recorded and advancement of the boring will be terminated to prevent introducing NAPL into deeper intervals. USEPA will be notified of the presence of NAPL at the location and the borehole location will be sealed in accordance with industry standards. Available stratigraphic information from such locations (up to and including the interval with detected NAPL) will be reviewed, and the location will be evaluated for additional work in Phase 2.

During borehole advancement, the amount of water added during Rotosonic drilling will be recorded. Every effort will be made to minimize the amount of water added during drilling in order to reduce the amount of purging required and to ensure that samples are representative of the groundwater in the aquifer formation. Groundwater samples will be collected at 5-foot intervals beginning at the 0 to 5-foot interval below the groundwater interface observed during borehole advancement. Groundwater samples will be collected from each discrete interval through a 5-foot long, stainless steel slotted screen using an inflatable packer with a submersible pump system. The flow rate for purging of groundwater will be dependent on the capacity of the submersible pump and the transmissivity of the aquifer material. Efforts will be made to maintain low flow during purging. Upon purging of two times the volume of water added during drilling (pre-purge), the flow rate will be reduced to the lowest sustainable flow rate and the minimum required screen volumes (i.e., three to five volumes of the 5-foot screened zone), will be purged. During the screen purging, field parameters such as pH, temperature, conductivity, oxidation-reduction (redox) reaction potential (ORP), dissolved oxygen (DO), and turbidity will be monitored to evaluate the stabilization of the purged groundwater. Groundwater samples will be collected once the parameters have stabilized as detailed in the FSP. VAS samples will not be collected from a 5-foot interval if attempts to purge and sample indicate the interval does not yield enough water to sample.

VAS will be completed to a depth of 100 feet below ground surface (bgs) at each location. All VAS samples will be analyzed for Target Compound List (TCL) VOCs,

total arsenic, and total lead. All of the groundwater samples collected during VAS and submitted to the laboratory will be unfiltered groundwater samples. In addition, VAS samples collected from select sampling intervals from each boring will be analyzed for TCL semi-volatile organic compounds (SVOCs) as discussed in further detail below. All of the groundwater samples collected during VAS and submitted to the laboratory will be unfiltered groundwater samples.

The sampling intervals that will be submitted for TCL SVOC analysis will depend on boring locations, whether the borehole is advanced through fill material (i.e., non-native material), or through native soil. The geophysical survey and, if the schedule permits, the test pit / test trench work that will be completed prior to the groundwater work discussed in this letter will help determine which VAS borehole locations are in fill material. The VAS borings determined to be located in fill material areas, or which have potential to be in fill material, will be completed first.

A total of four SVOC samples will be collected from each VAS boring as detailed below. In VAS borings drilled through fill (i.e., non-native) material, where the fill material extends below the water table, a maximum of three groundwater samples will be collected from the fill material for TCL SVOC analysis, and a minimum of one groundwater sample will be collected for TCL SVOC analysis from the native material directly beneath the fill material. The first sample in the fill material will be collected from the five-foot interval from the groundwater interface to five feet below the water table; subsequent groundwater samples collected from the fill material will be collected from every second five-foot interval. SVOC samples of native material will be collected at each five-foot interval commencing at the interface between the fill and native material. The total number of samples collected from the fill (i.e., non-native) material and from the native material at an individual VAS boring location will be dependant on the depth of fill material below the water table, i.e., if the fill material is sufficiently thick, three SVOC samples will be collected from the fill material and one from the native material, whereas if the fill material is thinner, fewer SVOC samples will be collected from the fill material and more samples will be collected from the native material (for a total of four SVOC samples per boring).

In VAS borings completed in native soil or where the fill material lies entirely above the water table, four samples for TCL SVOC analysis will be collected. The first sample will be collected from the five-foot interval beginning at the groundwater interface and the second from the interval from five feet below the water table to 10 feet below the water table. The third TCL SVOC sample will be collected at elevations corresponding to deeper areas of fill material below the water table. The fourth TCL SVOC sample will be

collected from the five-foot interval commencing at the elevation corresponding to the deepest fill material elevation observed in nearby borings advanced in non-native fill material. Sample elevations will be discussed with USEPA field representatives before starting VAS borings in areas believed to be in native soil areas.

The results of the VAS will be used to help select monitoring well locations (to be installed in Phase 2). The selection of monitoring well locations will be based on an analysis of VAS results and all existing data, including hydrostratigraphic data.

The proposed VAS borings are roughly laid out along four transects. The transects run approximately parallel to the section of the Great Miami River (GMR) northwest of the Site and continue toward the southeastern Site boundary. Following is a summary of the VAS boring locations, as identified along each transect, and the rationale for selecting each location. VAS boring locations may be revised based on the results of the Geophysical Survey and the Test Pit / Test Trench Investigation, which will be completed prior to the VAS sampling program if scheduling permits. Any modifications to the VAS boring and sampling program will be discussed with the USEPA prior to implementation.

Transect No.	***VAS Location No.***	***Rationale for VAS Location***
1	1	VAS location along northwest Site boundary to serve as a presumed upgradient data point. This location may be moved farther north along the transect, if possible, if fill is encountered.
	2	VAS location along northwest Site boundary and within 200 feet of MW-206 to evaluate aquifer data in vicinity of the well.

Transect No.	*VAS Location No.*	*Rationale for VAS Location*
1 cont'd.	3	VAS location along northwest Site boundary and within 200 feet of MW-201 and MW-103 to evaluate aquifer data in vicinity of these wells.
2	4	VAS location at northeast corner of Site boundary to serve as a presumed upgradient data point.
	5	VAS location to evaluate conditions in vicinity (or in presumed downgradient direction within vicinity) of former Dayton Recycling USTs. Off-set approximately 50 feet northwest of the transect.
	6	VAS location to evaluate conditions in vicinity (or in presumed downgradient direction within vicinity) of Valley Asphalt drum removal in 2000. Off-set approximately 100 feet northwest of the transect.
	7	VAS location to evaluate area presumed to be downgradient of material under the large asphalt stockpile. Off-set approximately 110 feet southeast of the transect.
	8	VAS location to evaluate area presumed to be downgradient of material under the large asphalt stockpile. VAS location to evaluate area downgradient of the large asphalt stockpile. Off-set approximately 275 feet southeast of the transect.
	9	VAS location to evaluate area presumed to be downgradient of material under the large asphalt stockpile. Off-set approximately 150 feet southeast of the transect.

2 cont'd	***VAS Location No.***	***Rationale for VAS Location***
	10	VAS location to evaluate the boundary between Parcel 5054 (Valley Asphalt) and Parcel 5177.
	11	VAS location to evaluate conditions at approximate center of PRPs' preliminary direct contact risk area (and located roughly 200-300 feet from former air curtain destructor).
	12	VAS location to evaluate presumed downgradient boundary of PRP Group's preliminary direct contact risk area.
	13	VAS location to collect data at southwest corner of Site boundary.
3	14	VAS location to evaluate conditions in vicinity of former Custom Delivery UST area. Off-set approximately 100 feet northwest of the transect.
	15	VAS location to evaluate aquifer conditions in vicinity of MW-202. Off--set approximately 225 feet southeast of the transect.
	16	VAS location to evaluate presumed downgradient boundary of PRP Group's preliminary direct contact risk area at northwest corner of Parcel 5176. Off-set approximately 225 feet southeast of the transect.
	17	VAS location to evaluate presumed downgradient boundary of PRP Group's preliminary direct contact risk area in vicinity of MW-203. Off-set approximately 100 feet southeast of the transect.
	18	VAS location to evaluate presumed downgradient boundary of PRP Group's preliminary direct contact risk area in vicinity of MW-101A and MW-204. Off-set approximately 200 feet northwest of the transect.
	19	VAS location within 200 feet of MW-209 and MW-212 to evaluate aquifer data in vicinity of these wells. If this location requires offsetting during field operations, it will remain at least 100 feet away from the edge of the Quarry Pond.
	20	VAS location to collect data south of the Quarry Pond.
4	21	VAS location to evaluate conditions within vicinity of MW-210. Off-set approximately 50 feet southeast of the transect.
	22	VAS location east of Quarry Pond to evaluate conditions at southeastern boundary of Site and Parcel 4423.
	23	VAS location to collect data at southeast corner of Site.

Two additional locations, 24 and 25, are proposed on the trailer park parcel to evaluate off-Site conditions in the presumed downgradient direction from MW-210.

The soil boring that will be used to log the subsurface material below the large asphalt pile will be advanced to a depth of 5 to 10 feet below the first native material encountered beneath the large asphalt pile (as determined in the field). The borehole will be advanced via Rotosonic drilling techniques, but VAS samples will not be collected from this borehole location. During borehole advancement below the large asphalt pile, continuous soil cores will be observed, soil stratigraphy will be logged and cores will be screened for the presence of VOCs and methane in the same manner as the VAS borings. A photographic log will also be compiled from each 5-foot soil core interval at this location.

Existing monitoring wells will be inspected, repaired as needed, and redeveloped to attempt to produce a silt free condition prior to water level monitoring and sampling. Redevelopment of wells and handling of investigative derived waste, including water from purging and pre-purging during VAS, will be performed in accordance with the USEPA-approved FSP.

2) Synoptic Water Level Measurements

Synoptic water level measurement events (groundwater and surface water) will be conducted in order to get a better understanding of groundwater flow directions. Note that staff gauges or measurement points will first be required for the GMR, Quarry Pond, and other surface water bodies. The reference elevations of the existing monitoring wells will be re-surveyed. Synoptic water level measurements will be completed using all permanent well installations and surface water measurement points once a month for the remainder of 2008. Any surface water measurement points that are disturbed during ongoing synoptic water level measurements will be immediately replaced and resurveyed. An oil/water interface probe will be used to monitor for the presence of light NAPL (LNAPL) in monitoring wells that are screened at the water table.

3) Groundwater Sampling

A round of groundwater sampling for TCL VOCs, TCL SVOCs, TCL pesticides and herbicides, TCL PCBs, and TAL metals will be completed at the existing monitoring wells. Groundwater sampling will be conducted using low flow field sampling procedures. The data will be compared with VAS results to assist in determining the adequacy of the existing monitoring wells.

The results from these three tasks will be summarized in a Technical Memorandum that, using new and existing data including representative hydrostratigraphic data and groundwater/surface water flow maps, will support and include the work proposed for Phase 2. The Technical Memorandum will be prepared following receipt of VAS analytical results and will contain only initial rounds of synoptic water level measurements. The Technical Memorandum will be reviewed in a project team workshop, similar to the meetings held with USEPA and Ohio EPA in early 2008.

Phase 2

Phase 2 will consist of three main work tasks – monitoring well installation, groundwater sampling, and continuous hydraulic monitoring.

1) Monitoring Well Installations

New monitoring wells will be installed based on the results of the Phase 1 VAS and all existing data, including hydrostratigraphic and groundwater/surface water flow data. If appropriate, the existing wells will be incorporated into the groundwater monitoring well network. All newly installed monitoring wells will be developed following installation. Following development, slug tests will be completed in each new monitoring well and in existing wells that will be kept/incorporated in the monitoring well network.

2) Groundwater Sampling

The Phase 2 groundwater sampling will include two rounds of sampling from the newly installed monitoring wells and, if appropriate, the existing wells. The first round of samples will be collected two weeks after installation and development of the monitoring wells and the second round will be collected two months later. The analyses will include TCL VOCs, TCL SVOCs, TCL pesticides and herbicides, TCL PCBs, and TAL metals, and monitored natural attenuation (MNA) parameters. The MNA parameters included in the analysis will be consistent with the USEPA Region 5 Monitored Natural Attenuation Framework. The complete list of MNA parameters is provided in Table K.3.3 of the QAPP. The analytical parameters may be reduced for the second round of sampling. The PRP Group will propose reductions in analytes, as appropriate, for USEPA's approval.

3) Continuous Hydraulic Monitoring

The monthly synoptic water level measurements described above would continue through Phase 2. More detailed hydraulic monitoring would be completed by installing transducers in select wells and surface water bodies. The transducers would provide continuous water level measurements that would aid in the evaluation of groundwater/surface water interactions. The data generated for this investigation would support the evaluation of remedial alternatives for the FS.

All work will be performed in accordance with the Field Sampling Plan, Quality Assurance Project Plan, and Site Specific Health and Safety Plan pending USEPA's approval of these documents.

SCHEDULE

Phase 1 fieldwork will be initiated within four weeks of USEPA approval of this Letter Work Plan, or the Field Sampling Plan, Quality Assurance Project Plan, and Site Specific Health and Safety Plan, and completion of the Geophysical Survey and, if the schedule permits, the Test Pit/Test Trench Investigation, whichever occurs later. The Phase 1 field tasks will be completed within a four-week period of time using two drill rigs working simultaneously. This schedule is subject to contractor availability and the actual drilling conditions encountered. The PRP Group will provide USEPA with written notification as much in advance as possible, but at least fifteen days in advance of the initiation of field activities. Phase 2 field work will begin following USEPA's approval of the Phase 1 Technical Memorandum. Monthly synoptic water level measurements will be taken throughout the remainder of 2008.

REPORTING

Phases 1 and 2 technical memoranda will be submitted to USEPA within two weeks of receipt of all data from the laboratory. The Phase 2 Technical Memorandum will provide a summary of results from monitoring well installation, groundwater sampling, and continuous hydraulic monitoring. Monthly progress reports during the Phase 1 and Phase 2 work will include the information required for monthly progress reports in the RI/FS SOW (including analytical data, groundwater/surface water elevations and stratigraphic information as it comes in).

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Stephen M. Quigley

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Encl.

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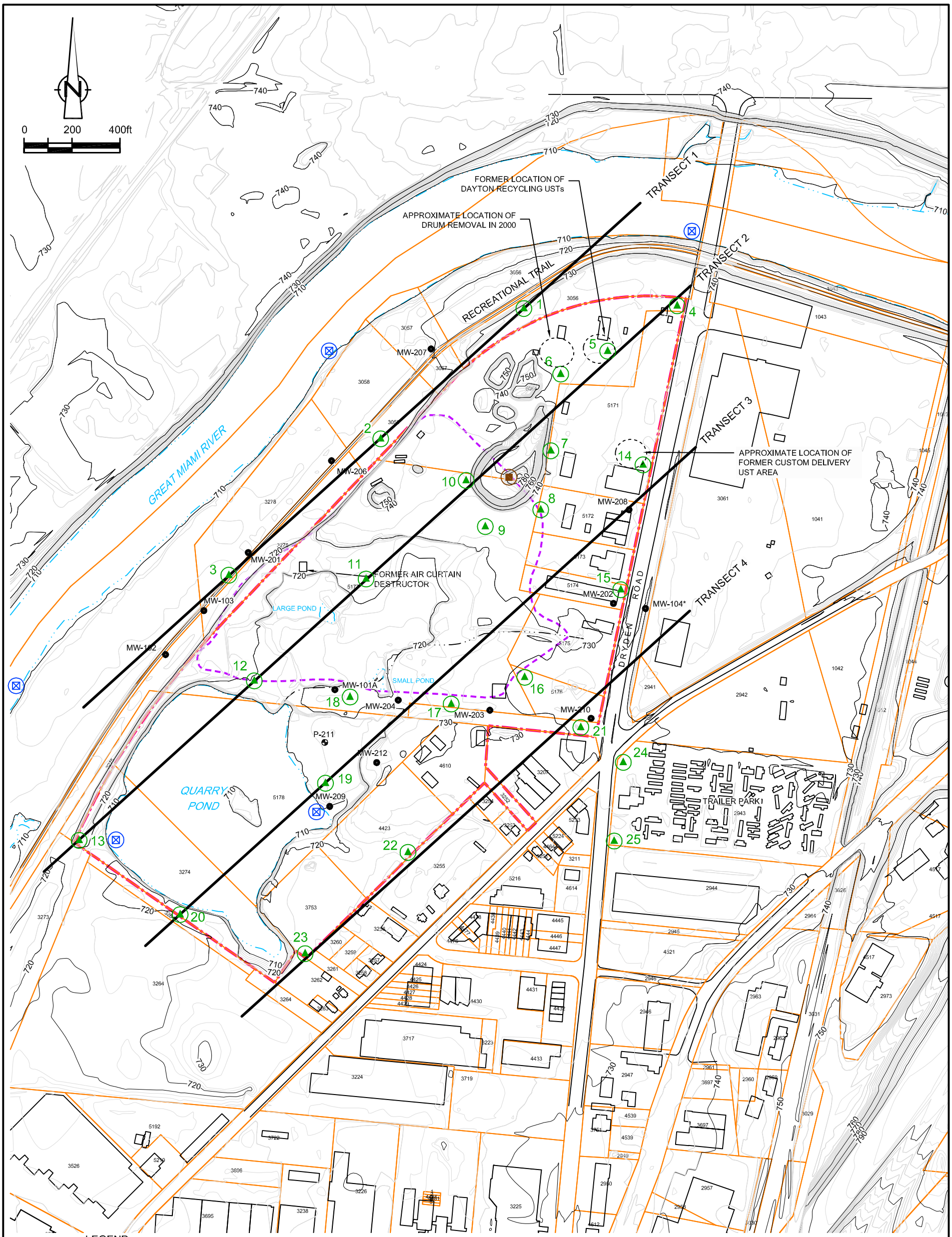

LEGEND

- SITE BOUNDARY (SOW 2006)
- PRELIMINARY DIRECT CONTACT RISK PRESUMPTIVE REMEDY AREA
- 730 EXISTING GROUND CONTOUR (2 FT CONTOUR INTERVAL)
- EDGE OF WATER
- MW-206 INTERMEDIATE ZONE MONITORING WELL LOCATION
- P-211 PIEZOMETER LOCATION
- PARCEL BOUNDARY
- 3264 LOT NUMBER
- * APPROXIMATE LOCATION
- PROPOSED VAS SAMPLING LOCATION
- PROPOSED SURFACE WATER ELEVATION MONITORING LOCATION
- PROPOSED SOIL BORING LOCATION (TO LOG FILL MATERIAL)

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.

figure 1

VERTICAL AQUIFER SAMPLING LOCATIONS
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio